Steve Munro
Compliance Project Manager
Systems Assessment & Facility Siting Division
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, CA 95814

January 7, 2005

Re: Metcalf Energy Center (99-AFC-3C), Amendment to Air Compliance Conditions
Revisions to CO Startup Modeling

Dear Mr. Munro:

On December 23, 2004, Calpine Corporation was advised by the staff of the Bay Area Air Quality Management District (District) that in reviewing our application for minor modifications they had determined that our revised modeling analysis could trigger additional regulatory requirements. Specifically, Table 7 of the application for modification indicated that the maximum 8-hour average CO impact during a 6-hour cold steam turbine startup or combustor tuning procedure was determined to be 875 :g/m^3. This value exceeded the pre-construction monitoring exemption level of 575 :g/m^3 in District Regulation 2-2-111, potentially subjecting the project to the preconstruction monitoring requirements of District Regulation 2-2-414.3.

We reviewed the assumptions used in evaluating the 8-hour CO concentration during startups and determined that we had been overly conservative in calculating the emissions from the second gas turbine during the eight-hour startup period. The original calculation assumed that the first gas turbine was in startup for the first six hours of the eight-hour period, with maximum emissions of 5,028 lb (the proposed new maximum CO emission rate allowed during a six-hour startup period), with the last two hours of operation at the maximum permitted emission rate during normal operation. The original calculation also assumed that the second gas turbine started up during the last two hours of the eight-hour period and that the second gas turbine was also in cold steam turbine startup mode, with maximum emissions of 5,028 lb during that two-hour period. This resulted in total CO emissions for the two gas turbines during that eight-hour period of 10,112 lb of CO.

This calculation of CO emissions for the second gas turbine was unrealistically high because once the first gas turbine has gone through a cold steam turbine startup, the steam turbine would be at operating temperature and the second gas turbine would not also be required to undergo an extended startup. Therefore, the revised calculation assumes that after the first gas turbine undergoes a six-hour cold startup, the second turbine has a warm start for the last two hours of the eight-hour period (since the warm start hourly emission rate, 902 lb/hr, is slightly higher than the cold start hourly emission rate of 838 lb/hr). This emissions scenario gives a maximum 8-hour CO impact of 495 :g/m^3, well below the PSD preconstruction monitoring threshold of 575 :g/m^3. Total emissions from the two turbines during the eight-hour period are 6,888 lb

The attached table shows the calculation of the revised emission rates; only the 8-hour average CO emissions calculation has changed. The enclosed diskette contains the input and output files for the revised modeling of 8-hour average CO impacts.

If you have any questions, please do not hesitate to call me at (408) 361-4953 or Nancy Matthews of Sierra Research at (916) 444-6666.

Sincerely,

Mark Smolley

Mark Smolley
Compliance Manager

Enclosures: Modeled Impacts during Turbine Startup
CD with Modeling Data

cc: (w/o diskette)
Barbara McBride, Calpine
Bob McCaffrey, Calpine
Dennis Jang, BAAQMD Permit Services
Glen Long, BAAQMD Planning Division
Jeff Harris, Ellison Schneider & Harris

Metcalf Energy Center
Modeled Impacts During Turbine Startup
Revised 12/23/04

	Stack Diam, m	Stack Height, m	Exh Temp, Deg K	Exhaust Flow, m3/s	Exhaust Velocity, m/s	NOx Emission Rate 1-hr avg	CO Em Rate, g/s 1-hr avg	CO Em Rate, g/s 8-hr avg
Averaging Period: One hour								
Turbine 1/HRSG	5.486	44.196	349.667	347.3	14.690	60.480	633.528	n/a
Turbine 2/HRSG	5.486	44.196	349.667	451.3	19.090	2.420	3.537	n/a
Averaging Period: Eight hours								
Turbine 1/HRSG	5.486	44.196	349.667	451.3	19.090	n/a	n/a	***80.075***
Turbine 2/HRSG	5.486	44.196	349.667	451.3	19.090	n/a	n/a	***14.207***
Em. Generator	0.229	9.144	649.111	2.0	48.410	n/a	n/a	0.04749

NOx Emission Rate 1-hr avg	CO Emission Rate 1-hr avg	CO Emission Rate 8-hr avg
480.0	5028.0	n/a
19.21	28.07	n/a
n/a	n/a	635.5
n/a	n/a	112.75
n/a	n/a	0.38

Notes: 1-hour averaging period: One turbine in startup, one turbine at max load
8-hour averaging period: One turbine in startup for first 6 hours; second turbine in startup for last two hours; emergency generator tested for 1 hour.